



National Highway Safety Traffic Administration
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Consumer Reports' Comments on NHTSA's Proposed Rule "Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035"

(Docket ID: NHTSA-2023-0022-0004)

Submitted via: www.regulations.gov

Executive Summary

Consumer Reports (CR) supports the National Highway Traffic Safety Administration (NHTSA) implementing strong new federal Corporate Average Fuel Economy (CAFE) and fuel efficiency standards for vehicles sold in MY2027 and beyond. CR recommends that NHTSA finalize a rule that results in a CAFE target of 65-68 mpg in 2032. This target is achievable, and would continue the success of NHTSA's MY2024-26 Rule and maximize savings for consumers. Since Congress first passed CAFE standards in 1975, NHTSA has continued to update these standards, saving consumers money at the pump, reducing emissions, and protecting our health.

CR finds that the current proposal could -- and should -- be stronger. CR's analysis shows that a CAFE target of 65-68 mpg is both feasible for auto manufacturers and will maximize cost benefits to consumers. NHTSA has a statutory obligation to set CAFE standards at the "maximum feasible" level that the agency determines vehicle manufacturers can achieve in each model year in order to improve energy conservation.

Historically, strong CAFE standards have been an extremely cost effective policy. A recent CR analysis found that, over the past two decades, stringent fuel economy standards have delivered 30% improvement in average fuel economy, and \$7,000 in lifetime fuel savings for the average vehicle, without driving up vehicle prices.

Upon a closer look, CR's analysis finds that NHTSA's modeling greatly underestimates the cost-effectiveness of hybrids. Analysis of the top ten best selling hybrids on the market found that these hybrids would deliver \$5 in fuel savings for every \$1 in increased vehicle purchase price over the life of the vehicle. All 10 hybrids were also found to deliver consumer savings in the first year of ownership when financed. NHTSA should improve the cost-effectiveness parameters in their modeling in order to appropriately reflect the consumer benefits of this important compliance technology.

Consumers want more fuel efficient vehicles. CR's recent surveys and analyses have found that most Americans want to see fuel economy continue to improve for all vehicle types, and a majority would buy a more expensive vehicle if they could save more money on fuel than the increase in their monthly vehicle payments. CR has also collected 39,533 signatures from consumers who support a strong NHTSA proposal for fuel economy standards, which will be submitted with these comments.

CR recommends that NHTSA improve their modeling parameters for the cost-effectiveness of hybrids, and finalize a rule that results in a CAFE target of 65-68 mpg in 2032 to maximize benefits to consumers.

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4. Vehicle Price Trends: Fuel Economy and Safety Come Standard
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1. Introduction

1.1 About Consumer Reports

Founded in 1936, Consumer Reports (CR) is an independent, nonprofit and nonpartisan organization that works to create a fair and just marketplace for consumers. Known for its rigorous testing and rating of products and vehicles, CR also advocates for laws and corporate practices that are beneficial for consumers. CR is dedicated to amplifying the voices of consumers to promote safety, digital rights, financial fairness, and sustainability. The organization surveys millions of Americans every year, reports extensively on the challenges and opportunities facing today's consumers, and provides ad-free content and tools to 6 million members across the United States. In the area of transportation, CR is working to ensure affordable, clean and safe mobility choices for all consumers.

1.2 Benefits of Strong Fuel Economy Standards for Passenger Cars and Light Trucks

Strong fuel economy standards have the power to save consumers money at the pump and increase energy security. CR's 2023 report "*Vehicle Price Trends: Fuel Economy and Safety Improvements Come Standard*"¹ analyzed fuel efficiency improvements from model years 2003 to 2021 and found that vehicle fuel efficiency had improved by 30 percent during that time, saving consumers an average of \$7,000 in fuel over the lifetime of their vehicle with no increase in vehicle prices, when adjusted for inflation.

The CAFE standards also drive down vehicle tailpipe pollution and greenhouse gas emissions (GHG), thus reducing public health spending tied to air pollution, and reducing spending on disaster recovery tied to GHG emissions.

NHTSA should consider that the uncertainty of fluctuating gas prices largely hits hardest for low-income Americans who spend a larger portion of their income on fuel, relative to wealthier households. According to federal data from the U.S. Bureau of Labor Statistics, in 2022, Americans spent an average of 4.3% of their budgets on gasoline, motor oil and other fuels. However, those with \$30,000 to \$40,000 of annual pre-tax income spent a larger portion (5.1%) of their budgets at the pump, on average than higher earning households². Gasoline spending as a share of annual expenditures skews downward as income grows.

¹ Consumer Reports, "Vehicle Price Trends: Fuel Economy and Safety Improvements Come Standard," Feb 21, 2023, <https://advocacy.consumerreports.org/research/vehicle-price-trends-report/>.

² U.S. Bureau of Labor Statistics, "Table 1203. Income before taxes: Annual expenditure means, shares, standard errors, and relative standard errors, Consumer Expenditure Surveys," 2022, <https://www.bls.gov/cex/tables/calendar-year/mean-item-share-average-standard-error/cu-income-before-taxes-2022.pdf>.

Low-income Americans mainly buy their vehicles on the used car market. If stronger CAFE standards are adopted, a significant portion of the benefits would flow to these consumers, who otherwise have no direct market mechanism by which to influence automaker decisions about what fuel efficiency technology they deploy in vehicles. Strong standards will not only help protect American drivers from volatile gas prices, but will also prompt the auto industry to deliver more efficient vehicles.

1.3 Consumers Want Strong Standards

1.3.1 Fuel Economy Survey Findings

CR's surveys find that consumers care about fuel economy. In 2022, Consumer Reports conducted a nationally representative survey of 2,161 American adults to assess their beliefs and attitudes about fuel economy, including the fuel economy of their current vehicle.³ The results show that the majority of American drivers value fuel economy and want to see automakers making improvements in fuel economy for all vehicle types.

Notably, CR's survey found that seven in ten American drivers say that fuel economy is very important or extremely important to them when considering what vehicle to purchase or lease. When asked which attributes of the vehicle they drive most often have the most room for improvement, drivers most commonly selected fuel economy (43%), with purchase price and maintenance costs following distantly (30% and 27%, respectively). The full results from this question are shown in Figure 1.1.

Other key findings from the survey include:⁴

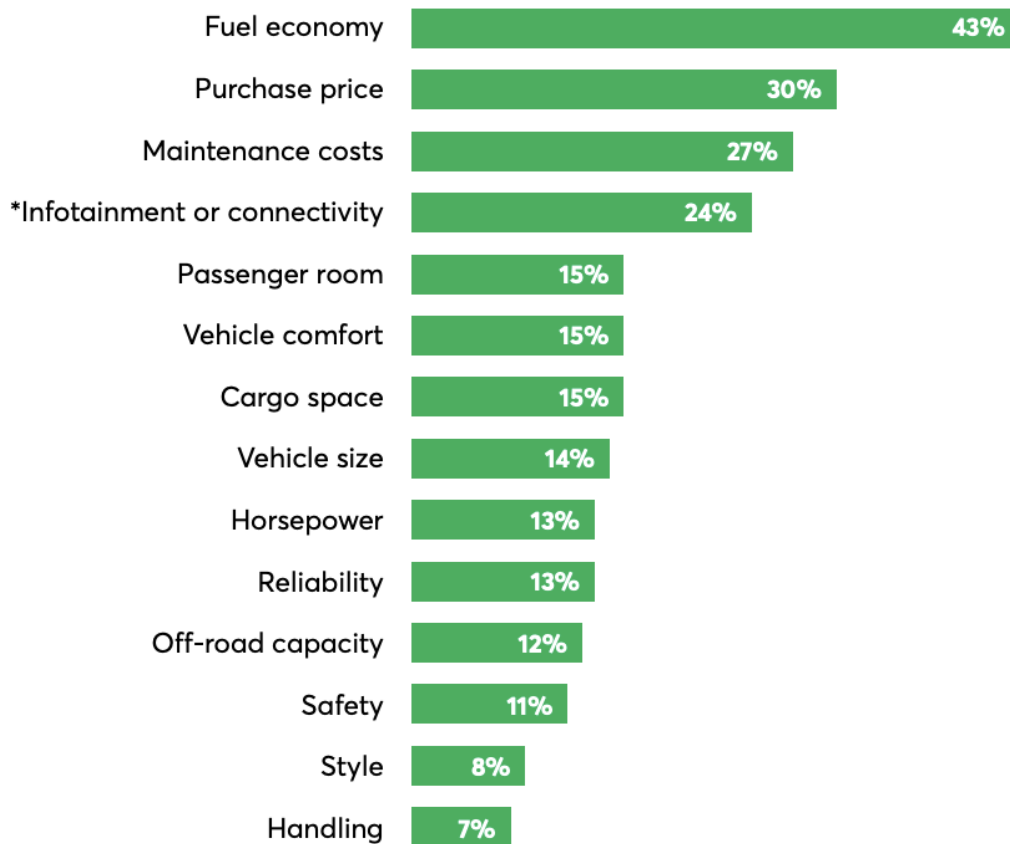
- 85% of Americans agree or strongly agree that automakers should continue to improve fuel economy for all vehicle types;
- 82% agree or strongly agree that making larger vehicles more fuel-efficient is important;
- 78% agree or strongly agree that they expect each new generation of vehicles to be more fuel-efficient; and
- 77% agree that automakers have a responsibility to continue to improve gas mileage.

³ Consumer Reports, "Autos fact sheet: CR survey on Americans' attitudes about fuel economy, hybrid vehicles," March 6, 2023, <https://advocacy.consumerreports.org/research/autos-fact-sheet-cr-survey-finds-americans-identify-fuel-economy-as-important-when-shopping-for-vehicles/>.

⁴ Consumer Reports, "Fuel economy: A nationally representative multi-mode survey," November 2022, https://article.images.consumerreports.org/image/upload/v1670867143/prod/content/dam/surveys/Consumer_Reports_Fuel_Economy_National_September_October_2022.pdf

In terms of willingness to pay for improvements in efficiency, the survey found that seven in ten (70%) Americans said that they would buy or lease a vehicle with a higher monthly payment if they would save enough at the pump to make their total monthly expense lower.

Thinking about the vehicle you drive most often, which three attributes have the most room for improvement? Select up to three responses.



Source: CR nationally representative survey of 2,161 U.S. adults conducted September and October, 2022. This question was only shown to the 2,081 who drive. *Response abbreviated to fit.

Figure 1.1: Attributes of their Current Vehicles that American Drivers Say Have The Most Room for Improvement

1.3.2 Consumer Petition

CR has collected 39,533 signatures from consumers in support of strengthening strong federal rules to reduce fuel consumption, reduce emissions, and save money at the pump. The signatures are attached to these comments.

Petition Text:

“We’re urging NHTSA and the EPA to adopt the strongest possible rules to reduce climate- and health-damaging vehicle emissions and greatly reduce fuel consumption, while helping consumers save thousands of dollars over the lifetime of a new vehicle. The rules will rapidly accelerate the number of cleaner vehicles like EVs and hybrids in production over the next decade; dramatically increase gas mileage; save lives due to a decrease in tailpipe pollution; and put us on the route towards a zero emissions future. These rules are a win-win for the climate, consumers’ wallets, and our health!”⁵

2. Strong standards do not lead to higher vehicle prices

A February 2023 CR report, *“Vehicle Price Trends: Fuel Economy and Safety Improvements Come Standard,”*⁶ analyzed vehicle price data from model years 2003 to 2021. Statistical analysis of purchase data from vehicles purchased for CR’s testing program from model years 2003 to 2021 showed no systemic, statistically significant change in vehicle prices over the period when adjusted for inflation. Over the same period the study found that vehicle fuel efficiency had improved by 30 percent during that time, saving consumers an average of \$7,000 in fuel over the lifetime of their vehicle.

This study showed continuous incremental improvements in fuel economy in every vehicle class over this period, even while accounting for a consumer shift toward buying larger, more expensive crossovers and SUVs in recent years. Fuel-economy improvement over the study period ranged from 20% for pickups to 56% for SUVs, as shown in Table 2.1 and as illustrated in Figure 2.1. For 2021 models, CR found these improvements to have a lifetime fuel savings of \$6,200 for pickups to almost \$11,600 for truck SUVs, compared to what fuel would have cost if fuel economy had remained flat at 2003 levels.

⁵ Consumer Reports, “More Efficient Cars = Better Climate Future,” 2023, <https://action.consumerreports.org/nb-20230425-epa-cleancars-petition>.

⁶ Consumer Reports, “Vehicle Price Trends: Fuel Economy and Safety Improvements Come Standard,” Feb 21, 2023, <https://advocacy.consumerreports.org/research/vehicle-price-trends-report/>.
<https://advocacy.consumerreports.org/research/vehicle-price-trends-report>.

Table 2.1: Fuel Economy Improvements and Consumer Savings for Model Years 2003 to 2021

Vehicle Class	2003 Fuel Economy	2021 Fuel Economy	Percent Change	Lifetime Fuel Savings
Sedans/Wagons	23.3	32.2	38%	\$7,100
Car SUVs	19.9	31.0	56%	\$10,800
Truck SUVs	16.4	24.1	47%	\$11,600
Pickups	16.1	19.3	20%	\$6,200
Minivans	19.0	27.3	44%	\$9,600
All	19.6	25.4	30%	\$7,000

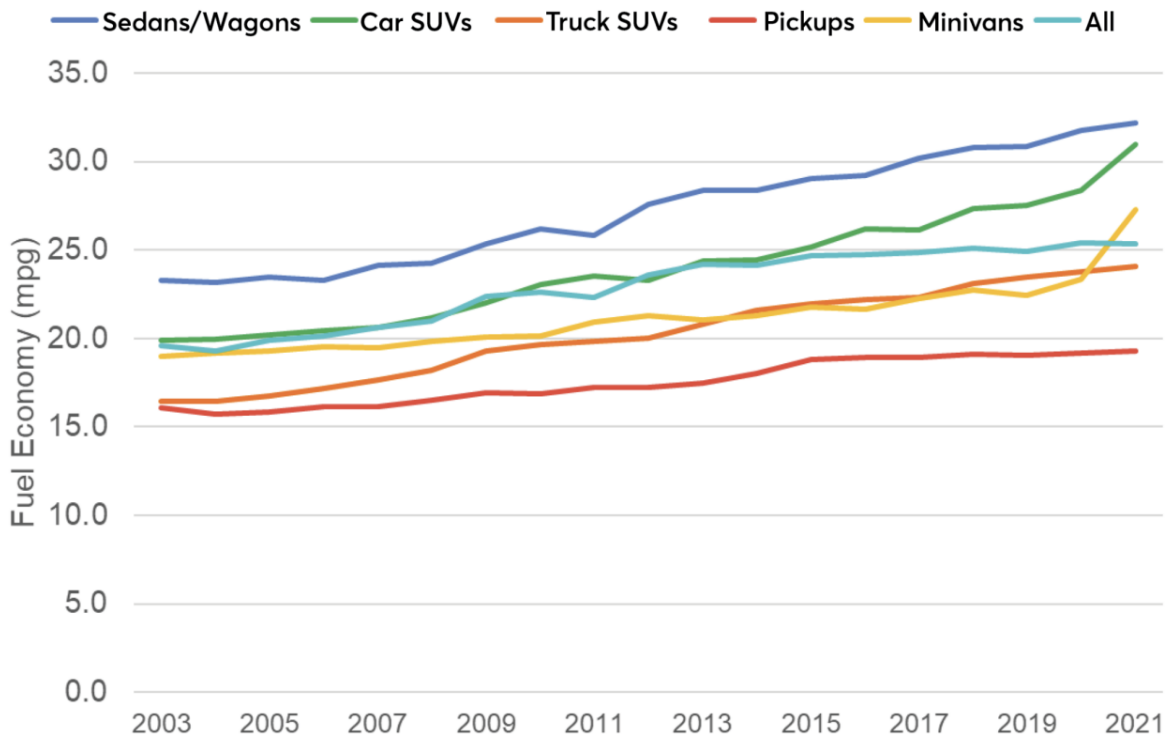


Figure 2.1: Average Fuel Economy by Vehicle Class by Model Year

The study focused primarily on the latest period for which CAFE standards were increasing at a steady rate. However, looking further back at the historical data tracked by the EPA Trends Report, the data suggests that automakers have not delivered fuel economy improvements when they are not required to meet strong fuel economy standards. This indicates that all or

nearly all of the efficiency gains over this period can and should be attributed to the presence of strong CAFE standards.⁷ This is discussed in more detail below in Section 5.1.

In addition to fuel economy, performance and safety also improved over the study period. Crash-test procedures were strengthened, electronic stability control and backup cameras were mandated on new vehicles, and advanced driver assistance systems became more widely available. Vehicles saw improvements in horsepower in all vehicle classes.

Commonly reported changes in average transaction prices appear to be primarily driven by shifts toward larger, more expensive SUVs and away from smaller and cheaper cars, rather than from the cost of technology improvements in individual models.

This analysis proves that strong federal fuel economy and greenhouse gas standards work and deliver huge savings to consumers. The analysis also shows that savings, in addition to the aforementioned improvements, have come with no statistically significant, inflation-adjusted cost to consumers in terms of increased vehicle purchase price.

3. Consumer Reports Recommended Stringency

This section outlines CR's analysis to support significantly higher stringency than the CAFE proposal. CR finds that NHTSA appears to be significantly underestimating the cost effectiveness of strong hybrids, an important compliance technology. Based on the analysis presented in this section Consumer Reports recommends that NHTSA finalize a rule that results in a CAFE target of 65-68 mpg in 2032.

3.1 Consumer Benefits of Hybrid Vehicles

CR finds hybrid vehicles to be a no-compromise solution for consumers. Hybrids offer consumer savings that far outweigh their cost, while delivering a driving experience, i.e. smooth acceleration and power, that is as good or better than similar non-hybrid vehicles.⁸ NHTSA is required by law to set a "maximum feasible" standard, and today's existing hybrid vehicles get significantly better fuel economy than their conventional counterparts, with no compromise in driving performance, so there is no excuse for all vehicles manufactured by 2032 not to be at least hybrid.

In order to demonstrate the consumer benefits of existing hybrid vehicles, CR analyzed the cost effectiveness of the ten best selling hybrids on the market for 2023. The hybrids were compared to a similar trim of the conventional gasoline version of the same or similar vehicle. Costs were

⁷ EPA, "The EPA Automotive Trends Report," 2023, <https://www.epa.gov/automotive-trends>

⁸ Consumer Reports, "Why Hybrid Vehicles Are a Smart Choice Right Now," March 2, 2023, <https://www.consumerreports.org/cars/hybrids-evs/why-hybrid-vehicles-are-a-smart-choice-right-now-a2736240282/>

estimated for the first year of ownership, a seven year first owner period, and a fifteen year, 200,000 mile ownership period.⁹ The full methodology is the same as was used in a 2020 CR study comparing the ownership costs of conventional gasoline, hybrid, plug-in hybrid and battery electric vehicles.¹⁰ Energy costs were updated using EIA's Annual Energy Outlook 2023, and vehicle purchase prices were based on MSRP as listed on manufacturers websites including any applicable destination fees.¹¹ The vehicles selected for analysis and their price, fuel economy and horsepower are shown in Table 3.1.

Table 3.1: Hybrid Cost Analysis Inputs

Hybrid Trim	Hybrid Fuel Economy (mpg)	Hybrid HP	Hybrid MSRP	ICE Trim	ICE Fuel Economy (mpg)	ICE HP	ICE MSRP
2024 CR-V 2WD Sport Hybrid	40	204	\$34,675	2024 CR-V 2WD EX	30	190	\$33,335
2023 Rav4 hybrid LE	40	219	\$32,575	2023 Rav4 LE AWD	30	203	\$31,025
2024 Accord Sport Hybrid	44	204	\$33,290	2024 Accord EX	32	192	\$31,005
2023 Sienna LE AWD	36	245	\$40,280	2023 Odyssey EX (FWD)	23	280	\$38,865
2024 F-150 Supercrew 4WD 3.5L Hybrid	23	430	\$58,540	2024 XLT Supercrew 4WD, 3.5L ecoboost	20	400	\$57,495
2024 Maverick Hybrid XL-Supercrew	37	191	\$26,495	2024 Maverick XL-Supercrew	26	250	\$24,995
2023 Corolla Hybrid LE	50	138	\$24,145	2023 Corolla LE	35	169	\$22,795
2023 Highlander Hybrid LE AWD	35	243	\$43,615	2023 Highlander LE AWD	24	265	\$42,440
2024 Tucson Hybrid Blue	38	226	\$33,660	2024 Tucson SEL AWD	25	187	\$32,225
2023 Sportage Hybrid LX	43	227	\$28,815	2023 Sportage LX	28	187	\$27,615

⁹ Consumer Reports, "CR Fact Sheet: Hybrid Vehicles are Cost Effective for Consumers," October 2023, https://advocacy.consumerreports.org/press_release/cr-fact-sheet-hybrid-vehicles-are-cost-effective-for-consumers/

¹⁰ Consumer Reports, "New analysis from CR finds that the most popular electric vehicles cost less to own than the best-selling gas-powered vehicles in their class," October 2020, https://advocacy.consumerreports.org/press_release/new-analysis-from-cr-finds-that-the-most-popular-electric-vehicles-cost-less-to-own-than-the-best-selling-gas-powered-vehicles-in-their-class/

¹¹ US Energy Information Administration, "2023 Annual Energy Outlook," March 16, 2023, <https://www.eia.gov/outlooks/aeo/>

The overall results of the analysis are shown in Table 3.2. Cost-effectiveness is calculated in a few different ways. The full lifetime fuel savings are compared to the cost premium of buying the hybrid version to produce an overall return on investment for the hybrid over a 200,000 mile lifetime. In addition, discounted net savings (3% discount rate) is calculated for a first owner i.e. over the first 7 years of the life of the vehicle, and over the vehicle's 200,000 mile lifetime.

Every one of the top ten best selling hybrids delivers a significant return on investment, averaging \$5 in lifetime fuel savings for every \$1 increase in vehicle costs. Net savings averaged \$2,000 for the first owner and \$4,100 over the vehicle lifetime. Furthermore, the analysis looked at savings in the first year of ownership and found that all ten hybrids would deliver greater fuel savings than the increase in payment due to the higher purchase price in the first year. In other words, every single hybrid analyzed delivered savings in the first month of ownership when financed and driven the average number of miles.

Table 3.2: Hybrid Cost Analysis Results

Vehicle	Lifetime Fuel Savings	Hybrid Cost Premium	Return on Investment	First Owner Net Savings	Lifetime Net Savings
2024 CR-V Hybrid	\$5,240	\$1,340	390%	\$1,360	\$2,910
2023 Rav4 Hybrid	\$5,240	\$1,550	340%	\$1,190	\$2,680
2024 Accord Sport Hybrid	\$5,170	\$2,290	230%	\$540	\$1,830
2023 Sienna	\$9,870	\$1,420	700%	\$3,510	\$6,700
2024 F-150 Hybrid	\$4,110	\$1,050	390%	\$1,270	\$2,260
2024 Maverick Hybrid	\$7,210	\$1,500	480%	\$2,500	\$4,320
2023 Corolla Hybrid	\$5,200	\$1,350	390%	\$1,340	\$2,870
2023 Highlander Hybrid	\$8,230	\$1,180	700%	\$2,930	\$5,590
2024 Tucson Hybrid	\$8,600	\$1,440	600%	\$2,890	\$5,620
2023 Sportage Hybrid	\$7,830	\$1,200	650%	\$2,720	\$5,230
Average	\$6,830	\$1,440	500%	\$2,020	\$4,120

It should be noted that in reality hybrids may save even more money over time. CR's data on maintenance and reliability has shown that hybrids are second to only EVs in terms of delivering

lower average maintenance costs.¹² Maintenance costs were not factored into this analysis, but over the vehicle lifetime, lower maintenance costs could add up to significant additional savings.

Given the real world data presented, NHTSA should investigate and re-evaluate their technology cost-effectiveness parameters for hybrid vehicle pathways. It should be noted that the real world cost premiums identified in Table 3.2 fall within the same range as the National Academies Technology Assessment estimates for the incremental cost of strong hybrids for MY2035.¹³ Improving the cost-effectiveness parameters for hybrid technology pathways in the Volpe model should allow NHTSA to show greater net benefits for all alternatives, but especially the more stringent ones.

3.2 Stringency with an All-Hybrid Fleet

CR analyzed the CAFE performance of existing hybrids on the market in 2023 to estimate the potential maximum CAFE value that could be achieved with a full hybrid fleet matching today's hybrid vehicle performance. A representative hybrid from each vehicle class was selected based on the vehicle classes included in the EPA trends report, and the EPA test data for the 2-cycle test was obtained from the EPA's 2023 Fuel Economy Guid data file.¹⁴ A fleet average value was then calculated using the sales share for each vehicle class from 2021 as reported in the EPA trends report.¹⁵

Once AC and off-cycle credits are factored in, CR estimates that automakers should be able to comply with a CAFE target of 56 mpg utilizing today's existing strong hybrid technology and no battery electric or plug-in hybrid vehicles in the fleet. These results are used in Section 3.4 to help analyze the potential for increased stringency for the CAFE rule.

¹² Consumer Reports, "Car Brands That Can Save You Money Over Time," April 20, 2023, <https://www.consumerreports.org/cars/car-repair-maintenance/car-brands-and-models-that-can-save-you-money-over-time-a9081677414/>

¹³ National Academies of Sciences, Engineering, and Medicine, "Assesment of Technologies for Improving Light-Duty Vehicle Fuel Economy – 2025-2035 - Table 4.6," 2021, <https://nap.nationalacademies.org/catalog/26092/assessment-of-technologies-for-improving-light-duty-vehicle-fuel-economy-2025-2035>

¹⁴ EPA, 2023 Fuel Economy Guide, 2023 Datafile, downloaded from: <https://www.fueleconomy.gov/feg/download.shtml>

¹⁵ EPA, "The EPA Automotive Trends Report," 2023, <https://www.epa.gov/automotive-trends>

Table 3.3: Estimated Maximum CAFE Stringency with a Full Hybrid Fleet

Vehicle Class	Make	Model	2-cycle MPG
Sedan/Wagon	Toyota	Camry	72
Car SUV	Toyota	Rav4	56
Truck SUV	Toyota	Highlander	49
Van	Toyota	Sienna	49
Pickup	Ford	F150	34
Fleet average without off-cycle and AC credits			50
Fleet average with off-cycle and AC credits			56

3.3 Electric Vehicle Baseline

CR recognizes that NHTSA is limited in their ability to consider battery electric vehicles as a compliance strategy for the CAFE rule. However, electric vehicles are a rapidly growing portion of US vehicle sales. Much of this growth in electric vehicle sales is not necessarily being driven by regulatory compliance, but by growing consumer acceptance and the economic benefits of owning an electric vehicle.¹⁶ This is supported by the fact that in 2023, through August, automakers that only sell battery electric vehicles (Tesla, Lucid, Polestar, and Rivian) accounted for 67% of all US EV sales.¹⁷ These automakers have very minimal direct regulatory incentive to sell electric vehicles and greatly over comply with all applicable regulatory standards. The cost advantages of EVs is supported by recent analysis by CR found, for example, that six, popular, mainstream EVs that qualify for tax credits under the inflation reduction act, will save consumers an average of around \$10,000 in lifetime ownership costs compared to a similarly equipped gasoline-powered vehicle.¹⁸ All six EVs analyzed also were estimated to deliver savings in the first year of ownership when financed. In order to finalize a rule that achieves its statutory requirements to set maximum feasible standards that continue to reduce fuel consumption from gasoline-powered vehicles, NHTSA must appropriately consider the market share of electric vehicles that will exist in the fleet in the absence of the CAFE rule. Failure to consider the significant and rapidly growing sales of electric vehicles will result in a rule that serves no useful purpose, because the stringency will be too low to affect automakers' decisions to deploy fuel saving technology.

¹⁶ Consumer Reports, "Excess Demand: The Looming EV Shortage," March 2023, <https://advocacy.consumerreports.org/wp-content/uploads/2023/03/Excess-Demand-The-Looming-EV-Shortage.pdf>.

¹⁷ Analysis by Consumer Reports of Ward's automotive monthly sales data for August 2023. <https://wardsintelligence.informa.com/WI967381/US-Light-Vehicle-Sales-August-2023>

¹⁸ Consumer Reports, "CR Fact Sheet: Electric Vehicles Save Consumers Money," June 2023, <https://advocacy.consumerreports.org/research/cr-fact-sheet-electric-vehicles-save-consumers-money/>

Table 3.4: Projections of future EV Market Share

Projection of EV Market Share	EV Market Share	Year
Year to date 2023 EV sales ¹⁹	0.09	2023
EPA greenhouse gas rule for 2026 ²⁰	0.17	2026
NHTSA proposal constrained baseline	0.32	2032
S&P global ²¹	0.40	2030
CBO projection with IRA ²²	0.42	2032
Automaker stated EV targets as estimated by EPA ²³	0.49	2030
President Biden Executive Order ²⁴	0.50	2030
Bloomberg New Energy Finance ²⁵	0.52	2030
NHTSA proposal unconstrained baseline	0.53	2032
ICCT projection with IRA ²⁶	0.56-0.67	2032
EPA greenhouse gas rule for 2032 ²⁷	0.67	2032
Goldman Sachs ²⁸	0.79	2032

¹⁹ Alliance for Automotive Innovation, “Alliance for Automotive Innovation Reports New U.S. Electric Vehicle Data,” September 25, 2023,

<https://www.autosinnovate.org/posts/press-release/2023-q2-get-connected-press-release>

²⁰ EPA, “EPA Finalizes Greenhouse Gas Standards for Passenger Vehicles, Paving Way for a Zero-Emissions Future,” December 20, 2021,

<https://www.epa.gov/newsreleases/epa-finalizes-greenhouse-gas-standards-passenger-vehicles-paving-way-zero-emissions>

²¹ S&P Global Mobility, “EV Chargers: How Many do we Need?,” January 9, 2023,

<https://www.spglobal.com/mobility/en/research-analysis/ev-chargers-how-many-do-we-need.html>

²² Congressional Budget Office, “Projected Effects of Federal Policies on the Demand for Electric Vehicles and the Supply of Charging Stations,” July 5, 2023,

https://www.cbo.gov/system/files/2023-07/59133_Austin.pdf

²³ Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light Duty and Medium-Duty Vehicles, 88 FR 29184, Table 1, 29184.

<https://www.govinfo.gov/content/pkg/FR-2023-05-05/pdf/2023-07974.pdf>

²⁴ The White House, “Executive Order on Strengthening American Leadership in Clean Cars and Trucks,” August 5, 2021,

<https://www.whitehouse.gov/briefing-room/presidential-actions/2021/08/05/executive-order-on-strengthening-american-leadership-in-clean-cars-and-trucks/>

²⁵ Bloomberg, “More Than Half of US Car Sales Will Be Electric by 2030,” September 20, 2022,

<https://www.bloomberg.com/news/articles/2022-09-20/more-than-half-of-us-car-sales-will-be-electric-by-2030#xj4y7vzkg>

²⁶ International Council on Clean Transportation, “Analyzing the Impact of the Inflation Reduction Act on Electric Vehicle Uptake in the United States,” January 2023,

<https://theicct.org/wp-content/uploads/2023/01/ira-impact-evs-us-jan23.pdf>

²⁷ EPA, “Proposed Rule: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles,” April 2023,

<https://www.epa.gov/regulations-emissions-vehicles-and-engines/proposed-rule-multi-pollutant-emissions-standards-model#:~:text=The%20proposal%20builds%20upon%20EPA%27s,to%20improving%20public%20health%2C%20to>

²⁸ Goldman Sachs, “The US is Poised for an Energy Revolution,” April 17, 2023,

<https://www.goldmansachs.com/intelligence/pages/the-us-is-poised-for-an-energy-revolution.html>

CR finds that NHTSA's modeled baseline in the proposal of 32% electric vehicles in 2032 to be extremely conservative. Even the unconstrained baseline of 53% EVs in 2032 likely underestimates the number of EVs that will be in the fleet in the absence of standards. Table 3.4 highlights a number of key projections or estimates of future EV market share. While there is significant variation in different estimates, even some of the most cautious estimates are significantly greater than NHTSA's constrained baseline, indicating that it is an extremely conservative approach.

NHTSA must ultimately make the decision on the baseline that they feel is best and most legally durable. However, being too conservative also risks finalizing a rule that does not effectively encourage improvements in fuel efficiency of gasoline-powered vehicles. This will be discussed more in Section 3.4.

3.3.1 Electric Vehicle Fleet Mix

NHTSA's baseline assumes that there are 42.2% EVs in the car fleet, but only 27.5% EVs in the light truck fleet in 2032. This disparity in the fleet mix greatly influences NHTSA's conclusion on the feasibility of achieving greater stringency, especially within the light truck fleet. This is contrary to the current direction of the market. Of the 44 unique battery electric vehicles in the EPA's 2023 test data file, 29 or 66% are pickups or SUVs.²⁹ Among the list of most anticipated EVs coming soon from major automakers, pickups and SUVs make up the vast majority.³⁰ While not every trim of every SUV on the market currently qualifies as a light truck under the CAFE regulation, automakers have historically shown adeptness at designing their SUVs to qualify as light trucks when there is a strong regulatory incentive to do so. CR expects the same trend to continue for EVs as volume increases and standards tighten. Given this, NHTSA should re-evaluate their assumptions around the fleet mix for EVs to better align with current and likely future market realities.

3.3.2 Electric Vehicle Efficiencies

CR analyzed the efficiencies of existing EVs on the market based upon EPA's 2-cycle test data and the new proposed petroleum equivalency factor (PEF) to determine their effective CAFE value. Vehicles were divided into the segments reported in the EPA trends report and market share values for the 2021 model year (the latest year for which final market share data is available) were used to produce a fleet average CAFE value. The values are also calculated utilizing the original PEF for comparison. The results of this analysis are shown in Table 3.5. These values are used in the following sections for modeling the maximum feasible CAFE stringency. All analysis is performed using the proposed new PEF unless otherwise specified.

²⁹ EPA, 2023 Fuel Economy Guide, 2023 Datafile, downloaded from: <https://www.fueleconomy.gov/feg/download.shtml>

³⁰ Consumer Reports, "Hot, New Electric Cars That Are Coming Soon," October 4, 2023, <https://www.consumerreports.org/cars/hybrids-evs/hot-new-electric-cars-are-coming-soon-a1000197429/>

Table 3.5: Estimated EV CAFE Compliance Value for Electric Vehicles by Vehicle Class

Vehicle Class	Average CAFE Compliance Value with Proposed PEF	Average CAFE Compliance Value with Original PEF
Sedan/Wagon	119	422
Car SUV	113	400
Truck SUV	92	327
Pickup	69	243
Fleet Average	98	347

3.4 Analysis of Maximum Feasible Standards

NHTSA is required by law to set maximum feasible standards. This section explores what that might mean in the context of the rulemaking for model years 2027-2032.

3.4.1 Estimated Maximum Feasible CAFE Stringency

In Section 3.2 above, CR estimated that existing hybrid technologies would allow for a CAFE target of 56 mpg with zero EVs in the fleet. However, as explored in Section 3.3, EVs are expected to make up a rapidly growing portion of the vehicle fleet in coming years. The fraction of EVs in the fleet that NHTSA uses for their baseline will influence the level of stringency that is achievable given that NHTSA cannot consider EVs as a compliance pathway.

CR estimates that when a hybrid fleet at 56 mpg is paired with NHTSA's EV baseline of 32% in 2032, a CAFE stringency of 65 mpg is feasible and compatible with EPA's proposed greenhouse gas standards. CR estimates that EPA's projected compliance fleet for their proposed 2027-2032 multipollutant standards would achieve a CAFE target of between 68-70 mpg depending on if the efficiency of EVs improves from today's levels. EPA's compliance fleet predicts that all compliance beyond 2027 will be with battery electric vehicles. In fact EPA's compliance fleet predicts some slight backsliding in the average efficiency of ICE vehicles. In terms of compliance with a similarly strong CAFE standard this is the worst case scenario, as EPA gives more compliance credit for electric vehicles. CR estimates that any compliance fleet for EPA's multipollutant standards that doesn't result in a large reduction in ICE efficiency or EV efficiency or both would also easily comply with a CAFE target of 65 mpg.

However, if NHTSA wants to set a rule that acts as a true backstop on backsliding on ICE efficiency, CR estimates that a CAFE target of about 68 mpg would work well. A CAFE target of 68 mpg would be feasible with an all-hybrid fleet and an EV baseline of 40% in 2032. A baseline of 40% EVs in 2032 is still lower than virtually all EV market projections, and is in line with CR's estimate of the minimum market share of EVs that could be used to comply with EPA's proposed

multipollutant standard in 2032.³¹ A CAFE target at 68 mpg would discourage compliance fleets that either result in backsliding on ICE efficiency or deploying a large number of highly inefficient EVs. However, balanced compliance fleets that pair continued incremental ICE improvements with significant deployment of EV in line with market demand should easily comply with both the EPA and NHTSA rules at this level.

CR also investigated the effect of the petroleum equivalency factor (PEF) on the ability of automakers to comply with proposed standards in 2027. The change in the PEF does effectively increase CAFE stringency in 2027, especially for fleets that use EVs as a primary compliance strategy. However, CR finds that most fleets that comply with the proposed 2027 EPA greenhouse gas targets should also comply with the proposed targets under the PC2LT4 (48 mpg) and PC3LT5 (49 mpg) alternatives. Both EPA and NHTSA project some improvement in ICE fleets over the course of their respective rules through 2026. Automakers that make absolutely no improvement to their ICE fleets during these years should still comply with at least PC2LT4 in 2027; however compliance is much easier for automakers that take a more balanced approach to compliance with both 2026 rules. Ultimately, balanced compliance approaches are best for consumers as they ensure that vehicle options across the fleet are improved, rather than delivering fuel savings only to consumers who are ready to adopt electric vehicles.

3.4.2 CR's Overall Stringency Recommendations

Based on the results of this analysis, CR recommends that NHTSA finalize a rule that achieves a CAFE target of between 65-68 mpg in 2032. At this range of stringency, automakers complying with EPA's multipollutant rule should also comply with these rules under most compliance pathways. However, the CAFE rules can provide an important balance by discouraging compliance pathways that result in backsliding on ICE efficiency, while encouraging greater efficiency in the EVs that are deployed. CR does not have a specific recommendation for stringency in specific model years to reach the recommended 2032 targets, but NHTSA should work with EPA to ensure consistency between the levels of stringency in each specific model year. Note that all recommendations on stringency are dependent upon the proposed PEF being finalized. Use of the original PEF or any increase from the proposed PEF would result in an increase in the numerical stringency required in order to achieve the same levels of real-world fleet performance.

³¹ See CR's comments on EPA's "Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles" proposal, Section 6.2, Table 6.1, page 21. Provided as Attachment 9 and available for download at: <https://advocacy.consumerreports.org/research/consumer-reports-formal-comments-on-epas-proposed-rule-for-cleaner-vehicles/>

4. Safety Impacts

Consumer Reports submitted detailed comments about NHTSA's safety modeling approach in comments on the 2024-2026 CAFE rule.³² However, NHTSA has not fixed any of the three key issues highlighted by CR in their previous modeling approach:

- The mass effects are not statistically significant
- NHTSA's sales and scrappage model greatly underestimates consumer willingness to pay (WTP)
- NHTSA still attributes part of the rebound driving risk to the rule, despite concluding that driving is a consumer choice, and that the risks of doing so are internalized

4.1 Mass Effects

NHTSA continues to erroneously attribute safety impacts to mass effects that are not statistically significant. NHTSA asserts that reducing the mass of heavier vehicles improves safety, while reducing mass in lighter vehicles reduces safety. NHTSA's draft proposal states, "*NHTSA believes the most recent analysis represents the best estimate of the impacts of MR that results in changes in mass disparities on crash fatalities, although it is important to note that these best estimates are not significantly different from zero and are not significant at the 5th confidence level.*"

Further compounding the uncertainty, NHTSA then multiplies these statistically insignificant coefficients by outputs from a highly uncertain dynamic fleet share model which attempts to make a prediction of changes in the future vehicle sales mix. Even more uncertainty is added by model algorithms which attempt to predict which automakers will deploy mass reduction technologies on which vehicles, a challenging task for an algorithm or a human to do accurately. This is especially important because NHTSA finds that mass reduction in larger vehicles is found to generally be slightly beneficial to overall safety, while mass reduction in smaller vehicles is found to have a slightly negative effect. Even if the coefficients were statistically significant, the combined uncertainty in the outputs from the dynamic fleet share model and the compliance pathways chosen by the CAFE model could tip the direction of the safety model toward either positive or negative with little certainty over which is the more likely outcome.

In the end NHTSA's modeling of mass effects multiplies statistically insignificant coefficients by highly uncertain predictions and spits out numbers that are close to zero. Given all of these

³² See CR's comments on NHTSA's New CAFE Standards for 2024-2026 proposal, Section 5, pages 17-20. Provided as Attachment 8 and available for download at: <https://advocacy.consumerreports.org/research/consumer-reports-comments-to-nhtsas-new-cafe-standards-for-2024-2026/>

nested layers of uncertainty NHTSA should instead conclude that the mass effects on safety are small and statistically indistinguishable from zero and leave it at that.

4.2 Sales and Scrappage Effects

CR generally supports NHTSA's approach to estimating fatality rates based on fleet composition. However NHTSA's estimates of changes to sales and scrappage rates are highly sensitive to assumptions on consumer willingness to pay (WTP) parameters and technology cost-effectiveness parameters. In Section 3.1, CR has already identified at least one potential area where NHTSA is underestimating the cost effectiveness of existing technology with hybrid technology pathways. In Section 5.2 below, additional analysis and data are presented to support much higher consumer WTP values. The combined effects of these two misestimations can greatly shift the estimates of crash impacts estimated by NHTSA's safety model.

In comments for the 2024-2026 CAFE rule, CR provided detailed modeling analysis that showed that using improved technology effectiveness parameters and a WTP value of 50% at a 3% discount rate, which is supported by the literature, resulted in the sign of both the sales impact and the safety impact flipping, indicating that more stringent standards would result in the sale of more new vehicles and an overall reduction in fatalities.³³

Finally, while the logic behind NHTSA's sales and scrappage model is logically sound, there is no empirical evidence to date that shows that these effects do in fact exist. Analysis of CR's historical vehicle purchases for its testing program presented in Section 2 and Attachment 4 found no empirical evidence for vehicle price effects of strong CAFE standards in the real world.

4.3 Rebound Driving

Driving, rebound or otherwise is 100% an individual consumer choice with the net benefits to the consumer of additional driving outweighing all additional costs, including safety. There is no evidence whatsoever to support NHTSA's assumption that consumers internalize only 90% of the safety risk associated with driving. However, even if none of the risk is internalized, any costs from driving more should not be attributed to the rule, because the choice to drive is a voluntary one, and not imposed on consumers by the regulation in any way.

At its core, the argument behind modeling the safety impacts of the rebound effect is that because improved fuel economy puts money back in consumers' pockets, it allows them to spend more money on driving, and more driving results in more of the negative externalities

³³ See CR's comments on NHTSA's New CAFE Standards for 2024-2026 proposal, Section 5, pages 19-20. Provided as Attachment 8 and available for download at: <https://advocacy.consumerreports.org/research/consumer-reports-comments-to-nhtsas-new-cafe-standards-for-2024-2026/>

associated with driving including safety risk. While this logic is sound on its face, applying it more broadly implies that any policy that puts money back into consumers' pockets would have a negative effect on vehicle safety because some fraction of that money might be spent on driving more. NHTSA and DOT do not apply rebound driving safety impacts as an aspect of any other policy that might influence consumers' finances or driving choices; therefore, it appears arbitrary and capricious to apply it here, but not in other cases.

5. Model Shortcomings

5.1 Overcompliance

As it has in the recent past, NHTSA's modeling continues to show significant overcompliance in the baseline scenario as well as many of the compliance alternatives analyzed. This overcompliance reduces the benefits that would otherwise accrue in the more stringent alternatives and thus reduces the modeled net benefits. In the case of overcompliance in regulatory alternatives, this overcompliance can potentially result in increased modeled compliance costs.

A key factor is the deployment of all technology with a 2.5 year payback period in the baseline. This level of technology application is not supported by the historical record when more stringent future standards are not imminent. Consumer Reports has comments on this in both the 2018 SAFE rule proposal and the 2021 CAFE proposal for model years 2024-2026.³⁴ Further discussion of consumer willingness to pay assumptions are included below in Section 5.2.

The historical data, tracked by the EPA Trends Report, indicates that automakers have not delivered fuel economy improvements when they are not required to meet strong fuel economy standards.³⁵ Since the inception of the CAFE program in the mid-'70s, there have been three distinct periods:

1. From the mid-'70s to the mid-'80s, a large increase in CAFE standards drove an increase in average passenger vehicle fuel economy from about 13.5 mpg in 1975 to 21.3 mpg in 1985.
2. Standards stagnated in the mid-'80s with no required improvement until 2005. Over this period average fuel economy dropped from 21.3 mpg in 1985 to 19.3 mpg in 2004.

³⁴ Consumer Reports, "Consumer Reports Comments on NHTSA's 'Corporate Average Fuel Economy Standards for Model Years 2024-2026 Passenger Cars and Light Trucks,'" October 26, 2021, <https://advocacy.consumerreports.org/wp-content/uploads/2021/10/Consumer-Reports-Comments-to-NHTSA-2024-2026-CAFE-Proposal.pdf>

³⁵ EPA, "The EPA Automotive Trends Report," 2023, <https://www.epa.gov/automotive-trends>

3. Standards began increasing again in 2005 and have continued increasing, resulting in average fuel economy reaching an estimated 26.4 mpg in 2022.

Automakers can and have shown a willingness to get a head start on early compliance on anticipated future standards, but in the face of stagnant or weak standards, there is no convincing evidence to date that they will actually deploy technologies to improve ICE efficiency over and above the minimum that is required for compliance, regardless of the technology cost.

5.2 Consumer Willingness to Pay

NHTSA's proposed CAFE analyses continue to assume a “payback period” of only 2.5 years to represent that consumers are willing to buy vehicles with more fuel economy technology because that technology will save them money on gas in the long run. CR has submitted comments questioning the validity of this assumption in both the 2018 SAFE rule proposal and the 2021 CAFE proposal for model years 2024-2026.³⁶ In this section we rehash some of those arguments, as well as provide some additional data to support a higher value for the consumer willingness to pay for fuel economy improvements.

Consumer Reports has decades of experience doing survey work to understand what consumers want. Our data continue to show that consumers do want improved fuel economy, and often are willing to pay for it.^{37,38} The literature review presented in Section 4.2.1.1 of the Technical Support Document for the 2024-2026 rule shows that a value between 50% and 100% of the discounted lifetime fuel savings is more justifiable than the 2.5 years assumed by NHTSA.³⁹

Overall, the general concept of “willingness to pay” in terms of payback time doesn't really reflect how consumers actually experience price increases and fuel savings. The vast majority of new car purchases in the US are financed.⁴⁰ The most common loan term has gone up to 72 months, with an 84-month loan not too far behind. In fact, over 73% of new car loans in the first quarter of 2022 were longer than 60 months — an increase of about 33 percentage points since

³⁶ Consumer Reports, “Consumer Reports Comments on NHTSA's ‘Corporate Average Fuel Economy Standards for Model Years 2024-2026 Passenger Cars and Light Trucks,” October 26, 2021, <https://advocacy.consumerreports.org/wp-content/uploads/2021/10/Consumer-Reports-Comments-to-NHTSA-2024-2026-CAFE-Proposal.pdf>

³⁷ See detailed survey results in Section 1.3.1

³⁸ Dr. Christine Kormos & Dr. Reuven Sussman, “Auto Buyers’ Valuation of Fuel Economy: A Randomized Stated Choice Experiment,” June 12, 2018, <https://advocacy.consumerreports.org/wp-content/uploads/2018/06/FINAL-Kormos-and-Sussman-2018-%e2%80%93-Auto-buyers-valuation-of-fuel-economy.pdf>

³⁹ Corporate Average Fuel Economy Standards for Model Years 2024-2026 Passenger Cars and Light Trucks, NHTSA-2021-0053, Technical Support Document, Section 4.2.1.1

⁴⁰ Experian, “Are More Drivers Financing New or Used Cars?,” October 29, 2020 <https://www.experian.com/blogs/ask-experian/new-vs-used-auto-loans-what-are-drivers-financing-more/>

2010.⁴¹ Longer loan periods mean that any increase in upfront cost of a vehicle is now spread out over a number of years; however the fuel savings starts immediately.

In our latest nationally representative fuel economy survey we asked Americans: “*If you had the choice to buy or lease a vehicle at a higher monthly payment, but would save enough at the pump that your total monthly expense would be lower, would you buy that vehicle?*” A total of 70% of Americans said yes they would.⁴² This indicates that consumers are generally rational and will preferentially purchase vehicles that lower their total monthly transportation cost. Given this, a willingness-to-pay estimate of 6 years of fuel savings (the current most common new vehicle loan length), discounted at the prevailing interest rate, would be a much more reasonable modeling approach.

However, this valuation is only on the consumer side. While consumers do indeed strongly value fuel economy, there is no evidence that automakers recognize this value and sufficiently incorporate it into their vehicle design plans, when not driven to do so by regulations. Consumers can’t choose to buy more efficient vehicles if automakers do not choose to manufacture them or force consumers to pay for more expensive trim packages they don’t want in order to access more efficient options. Consumers typically select the general class of vehicle they want and then choose among the available options. In sampling fuelconomy.gov, CR found that in most vehicle classes, beyond a few electric and hybrid options, most vehicles fall within a fairly narrow range, providing little in the way of true choice as far as fuel economy goes. However, strong standards drive those average fuel economy values gradually higher in all vehicle classes over time, benefiting all consumers. As shown in Section 2 and Attachment 4, the gradual nature of the technology improvements may even be such that most consumers never actually detect any real change in the price of vehicles after accounting for inflation. Thus, for many consumers, the net effect of the standards is that they experience the benefits of efficiency improvements with no noticeable change in vehicle prices.

Consumer Reports recommends that NHTSA use two separate values for the willingness to pay. Although there is uncertainty in the exact numbers with respect to what, if any, technology automakers will deploy in the absence of standards, and the exact amount of fuel savings consumers value, history, the record and the literature clearly show that these values should be very different. NHTSA should attempt to model automaker behavior based upon their past historical actions with respect to the application of technology within the baseline, which is that they are unlikely to deploy any. However, NHTSA should also update their consumer valuation of fuel economy assumptions in their sales model to more appropriately match the data and literature on consumer willingness to pay. Based upon the previous literature review undertaken by NHTSA, a value of at least 50% at a 3% discount rate is recommended. Alternatively, NHTSA should consider estimating consumer willingness to pay based upon typical loan lengths and interest rates. Using this methodology, CR would recommend using 6 years of fuel savings discounted at prevailing automotive loan rates.

⁴¹ Edmunds, “How long should my car loan be?,” 2022, <https://www.edmunds.com/car-loan/how-long-should-my-car-loan-be.html>.

⁴² Consumer Reports, “Fuel Economy,” February 3, 2023, <https://advocacy.consumerreports.org/wp-content/uploads/2023/03/Consumer-Reports-Fuel-Economy-2022-National-Sample-Report.pdf>

6. Conclusion

Consumer Reports (CR) thanks NHTSA for their efforts to set strong CAFE standards that lower the cost of fuel for American families. Strong CAFE standards will continue to save consumers money and improve public health. CR asks that NHTSA finalize the strongest possible standards that result in a CAFE target of 65-68 mpg in 2032 in order to maximize benefits to consumers and the environment.